HUMAN FERTILISATION AND EMBRYOLOGY AUTHORITY

PUBLIC CONSULTATION DOCUMENT

SEX SELECTION

INTRODUCTION

The purpose of this document

1. In 1990 Parliament passed the Human Fertilisation and Embryology Act which was concerned with regulating the provision of certain fertility treatments and with research involving human embryos. The Human Fertilisation and Embryology Authority (HFEA) was set up by the Act primarily to license and regulate all centres in the UK carrying out i) fertility treatment which involves the use of donated eggs or sperm (eg donor insemination), or of embryos created outside the body (in vitro fertilisation or IVF), ii) storage of eggs, sperm and embryos and iii) research on human embryos.

2. One of the other duties of the Authority is to provide guidelines for licensed centres offering assisted conception and to do so properly it must consider issues which are of concern to society generally. When addressing such issues the HFEA must not only take account of the concerns and interests of the licensed centres but also of donors, patients, children and the wider public. This document considers the issues surrounding sex selection and the ways of achieving it through assisted conception. It looks at the reasons for wanting to choose the sex of a child and addresses the arguments for and against each of the reasons and methods. By considering the ethical, social, legal and practical issues surrounding sex selection it is hoped that this document will stimulate a wide range of responses which the HFEA can take into account in deciding whether or when sex selection should be offered as part of licensed fertility services in the UK. This document is not concerned with the question of sex selection outside the UK.

What is meant by sex selection

3. Sex selection in this document means choosing the sex of a potential child through assisted conception. A man's sperm are of two types: half have an X chromosome and half have a Y chromosome. The sex of a baby is determined by which type of sperm fertilises a woman's egg. The X chromosome produces a girl and the Y chromosome a boy. In the past if a couple wished to have a child of a particular sex there was no sure way to have either a boy or a girl. Now medical techniques are becoming available which may give a greater chance of choosing the sex of a baby. One technique involves attempting to sort a man's sperm and then using either the X- or the Y-bearing sperm to give a girl or a boy. Another method is to identify the sex of an embryo created outside the body and transfer to the uterus an embryo of the required sex. These techniques are explained more fully later in the document.

SEX SELECTION AND THE LAW

4. According to the Human Fertilisation and Embryology Act 1990[1], a treatment licence issued by the HFEA can authorise an activity only if it appears to the Authority to be "necessary or desirable for the purpose of providing treatment services". In considering a new development in assisted conception, the Authority will therefore ask "Is this necessary or desirable?" before deciding whether an activity should be licensed. In making a judgment it will take into account:

- the respect that is due to human life at all stages in its development;
- the right of people who are or may be infertile to the proper consideration of their request for treatment;
- concern for the welfare of children, both of those who may be born and those already in the family, which cannot always be adequately protected by concern for the interests of the adults involved; and
- the benefits, both to individuals and to society, which can flow from the responsible pursuit of medical and scientific knowledge.

5. This document invites views about whether the selection of the sex of a potential child may be considered necessary or desirable in the context of licensed fertility treatment in the UK.

METHODS OF SEX SELECTION

6. For years people have tried to influence the sex of their future child by a variety of methods, such as eating special diets or having sexual intercourse in a particular way or at a particular time. There is little evidence to suggest that these methods are successful. This document is not concerned with methods such as these, which are entirely personal matters, but with methods which may require to be licensed by the HFEA. Medically assisted methods differ from "traditional" methods in that they may have greater success, though to a varying degree, and involve intervention by a third party in the form of a clinician. These methods can be divided into two groups: primary sex selection and secondary sex selection.

Primary sex selection

7. Primary sex selection occurs before an embryo is created and may be achieved in two ways: sperm sorting and timing of insemination.

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[1] *Human Fertilisation & Embryology Act (HFE Act) Schedule 2, paragraph 1(3).*

Sperm sorting

8. Attempts can be made to sort a man's sperm into those bearing the X chromosome, which is female determining, and those bearing the Y chromosome, which is male determining. The sperm giving the required sex can be used to inseminate a woman or can be used in IVF or other fertility treatments. The rate of success claimed for this technique is not proven: current proponents of the technique claim that there is an approximately 80 per cent chance of producing a child of the intended sex. The chance through normal sexual intercourse is about 50 per cent.

Timing of Insemination

9. The natural balance of numbers of male and female children in a population is achieved by a combination of factors. A man produces equal numbers of X- and Y-bearing sperm. There is some evidence that the sex of the child conceived is related to when an egg is produced (ovulation) in relation to the timing of intercourse, with a girl being more likely to be conceived if intercourse takes place at the time of ovulation. Some couples try to determine when ovulation is occurring and time sexual intercourse accordingly. There is no firm evidence to show that this is a reliable method. However, it is possible to monitor a woman's ovulation by hormone testing and hence time insemination more exactly to increase the chance of producing a child of one or other sex.

Secondary sex selection

10. Secondary sex selection occurs after fertilisation and may be achieved in two ways: before the embryo implants in the womb (by pre-implantation diagnosis) and after the embryo implants in the womb (by prenatal diagnosis and termination of pregnancy). The Abortion Act 1967, as amended, does not permit termination of pregnancy on grounds of fetal sex alone. That Act does not extend to Northern Ireland but termination of pregnancy on grounds of fetal sex alone would be outside the laws on abortion which obtain there.

Pre-implantation diagnosis

11. During IVF treatment, an embryo of a particular sex may be identified and transferred into a woman. The eggs are fertilised in vitro (outside the body) and left to develop for two days. A single cell is then removed without damaging the embryo and is examined for a Y or X chromosome. Only embryos of the required sex are replaced in the woman to implant in her womb. This method of selecting the sex is reliable, although the use of IVF may mean the chance of achieving a pregnancy is less than with normal sexual intercourse.

Prenatal diagnosis and termination of pregnancy

12. A pregnant woman may be screened by one of two methods to identify the sex of her baby. The screening may be by chorion villus sampling at about 10 weeks of pregnancy or by amniocentesis at 14-17 weeks. In the former a sample containing fetal cells is taken from the placenta. In the latter a sample of fluid containing fetal cells is removed from the fluid

sac surrounding the fetus. The fetal cells are analysed to identify the sex of the fetus just as in pre-implantation diagnosis. In this case, if the fetus is not of the required sex and there are grounds under the Abortion Act 1967, as amended, termination of pregnancy is a possibility. Issues concerned with abortion lie outside the jurisdiction of the HFEA and will not be considered further in this document.

REASONS FOR SEX SELECTION

13. There are two types of reasons for wanting to choose the sex of a child: medical reasons and social reasons.

Medical reasons

14. There are about 200 so-called "sex-linked" diseases which usually only affect males. A sex-linked disease is normally caused by a change or defect in the gene of the mother of the male affected. Such women are said to be carriers; they do not suffer from the disease itself but may pass the disease on to a male child. Some sex-linked diseases are not considered very serious, such as most forms of colour blindness, but others, such as haemophilia and Duchenne's muscular dystrophy, are much more so. Some serious sex-linked diseases cause death in early childhood. A couple with a history of a serious inherited disease in the woman's family or who already have a boy affected by the disease may want to choose to have a girl, to be sure of having a child free of the disease.

Social reasons

15. A couple may want to have a girl or a boy for a variety of social reasons. For example, they may already have a child, or children, of one sex and would like one of the other or they may attach higher status to one sex rather than the other.

ETHICAL ISSUES SURROUNDING THE REASONS FOR SEX SELECTION

16. Some reasons for sex selection may be ethically more acceptable than others. In order to decide if there are reasons for selecting the sex of a child which are necessary or desirable for the purposes for providing licensed treatment, the ethical issues surrounding the reasons need to be examined. The main arguments for and against sex selection for any reason, medical or social, are presented below.

17. It is worthwhile to remember that in the UK, sex selection for medical reasons is already permitted. In passing the Human Fertilisation and Embryology Act Parliament made the ethical decision that embryo research can be permitted to develop methods for detecting the presence of gene or chromosome abnormalities in embryos before implantation.[2] This decision was made in the full knowledge of successful research and a clinical trial which had

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[2] *HFE Act Schedule 2, paragraph 3(2)(e).*

recently been undertaken to establish the technique of pre-implantation diagnosis where there was a risk of a life- threatening sex-linked disease. In the view of the HFEA nothing has occurred since the Act was passed in November 1990 to undermine that decision where there is such a risk.

General considerations

Individual freedom of choice

18. It is argued that people should be allowed to exercise free will over as much of their lives as possible. Whilst some rules are necessary for the good of society, the selection of the sex of a child by an individual couple is a personal decision which does not affect society generally. Thus if medical science can enable a person to control a new aspect of their own lives without causing harm, then no other member of society has the right to prevent them from doing so.

19. Throughout history humans have sought to reduce their dependence upon the environment and upon chance events. The ability to influence sex determination is a particular aspect of this tendency. In the UK, the balance of the sexes in society is the result of many discrete events. Accepting the lottery of sex determination, the argument continues, cannot be said to be morally superior to exercising a choice.

20. On the other hand, it may be argued that individual choices might all be the same, so that collectively they would affect society. If the discrete events are influenced so that one outcome more often results than another, then the overall ratio of the sexes will be distorted. If a choice is permitted, the effect of many such choices could alter the balance which previously existed.

Natural balance between the sexes

21. A further argument often put forward is that sex selection would upset the balance of males and females that is produced by nature. However, since there may be natural fluctuations in this ratio, it may also be argued that there cannot be said to be an absolute natural balance which should not be disturbed.

Interference with the divine plan

22. It might be argued by many who have religious beliefs that the determination of the sex of a child is part of the divine purpose and that humans should not seek to interfere with this. Humans should not attempt to "play God" by making decisions about life at such a basic level.

Where will it end?

23. It is sometimes argued that to select children on the basis of their sex will lead to the selection of children for other characteristics, such as height and intelligence, and ultimately only "perfect" babies will be acceptable. Allowing sex selection might be said to be indicative, suggesting that people should strive to have an ideal family in terms of the order and balance of the sexes, the family size and health of the family members.

24. However, these so-called "slippery slope" arguments need not cause concern in the UK, where it is possible to draw a line permitting some activities and prohibiting others. Devising and enforcing rules to achieve this is a principal role of the HFEA. Thus if selection for a characteristic such as sex were acceptable to society in certain circumstances but selection on the basis of other criteria were not, the former could be allowed and the latter not.

25. Similarly, research would need to be undertaken to extend the number of genetic defects which could be detected by pre-implantation diagnosis. As with treatment licences, research licences can authorise only activities which appear to the HFEA to be necessary or desirable for any of the following purposes[3] -

a) promoting advances in the treatment of infertility,

b) increasing knowledge about the causes of congenital disease,

c) increasing knowledge about the causes of miscarriages,

d) developing more effective techniques of contraception, or

e) developing methods for detecting the presence of gene or chromosome abnormalities in embryos before implantation,

or for such other purposes as may be specified in regulations.

So there are a number of safeguards in place to enable a line to be drawn.

The effect on social attitudes

26. Finally, it might also be argued that to allow the purchase of a service providing sex selection would be to reduce children to a mere consumer good and an attitude may develop where a child is not valued for itself, but more because of its sex.

27. The counter-argument to this is that, it is likely that a child whose sex has been chosen will be loved as much, certainly not less, than any other, because its parents have taken care to influence its conception. Indeed, it might be argued that a child might be loved less if not of the desired sex.

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[3] *HFE Act Schedule 2, paragraph 3(2).*

Medical considerations

Sex-linked genetic diseases

28. As indicated in paragraph 17, the HFEA considers that pre-implantation diagnosis is ethically acceptable where there is a risk of a life threatening disease. Serious sex-linked diseases can cause considerable suffering and distress to the individuals and families involved and place a burden of care upon society as a whole. Some cause death at an early age. Given the choice, most people would rather have a healthy child than one which has a genetic disease. A person with a disease will often come to accept it but may rather have been healthy.

29. However, in reaching this conclusion, the HFEA takes the view that all human beings have intrinsically equal value and on this basis deserve equal respect. People with a disease or disability have a different experience of life, not a lesser one, than those without disease or disability. They have a different and equally important contribution to make to society.

30. It might be preferable if there were a cure for sex-linked diseases which could be administered without risk to new-born babies or to a male embryo in the womb or in vitro. In the absence of such a cure, those male embryos with the faulty gene could be identified by pre-implantation diagnosis and only those without it could be transferred to the woman. At present only one inherited disease, cystic fibrosis, can be unequivocally identified by pre-implantation diagnosis and this is not sex-linked. In one hospital in the UK, pre-implantation diagnosis is already used to select out male embryos in families where there is a history of Duchenne's muscular dystrophy. The next stage will be to identify those embryos with the faulty gene and to select against those only. At present, in the case of sex-linked diseases selecting against all male embryos is a compromise measure to ensure that a child will be born without the disease.

31. Some might argue that in making a judgement about whether an embryo with a disease should be selected against, a judgement is made about a person with that disease. In ensuring that another baby is not born with that disease, there is an implication that a living person with a disease should never have been born. Conversely, many would consider that the judgement is not about the person but about the disease. The parents of a child with disease do not wish for a different child, they wish for that child to be healthy. If potential parents are against sex selection because of the need to discard embryos, their choice is worthy of respect, as is the child born with disability or genetic disease.

32. There may be concern about which diseases are considered sufficiently serious to warrant the use of sex-selection. For example, whilst it may be easy to say that colour blindness is less serious than Duchenne's muscular dystrophy because it is not life-threatening, there are diseases which may be harder to judge. It would be difficult to agree a list of diseases which could be selected against. As described in paragraph 24, it is possible to enforce decisions about what should and should not be permitted. However, the decision could be left with the clinicians and parents in each individual case, taking account of the welfare of the child to be born and that of any other children in the family.

Social considerations

33. Those who might support sex selection for social reasons could argue that there is no evidence to show that allowing parents to choose the sex of their child would have an adverse effect on society in the UK. For example, if a couple have sons and want a daughter, or daughters and want a son, then even on a small scale, their choice would redress the balance of the sexes. They may value both sexes equally and therefore want both equally.

34. Furthermore, a couple whose children are all of the same sex may continue to have children in an attempt to have one of the other sex. In this way they may increase the size of their family beyond the size they would originally have preferred. If allowed to choose the sex of their child, they may have a smaller family. Allocation of resources in a densely populated country is an important concern of modern society; sex selection may contribute to a reduction, albeit very small, in population size through a reduction in the birth rate.

35. Progress in medical science has brought great benefits to individuals and society and the facility for sex selection is one such advance. It might be argued that it would be unjust to deny individuals the right to have access to this facility.

36. On the other hand, it could be argued that allowing sex selection for social reasons is admitting that gender has value, whichever sex is selected and in whatever proportions. In some sections of UK society there may be a tendency to choose one sex in preference to another. For example, where a title or assets may be inherited, a boy might be preferred as an heir. In some ethnic groups, men have a higher social status and, in addition, the cost incurred when a female child marries may be significant.

37. Furthermore, some people, whilst wanting boys and girls, would prefer their first child to be a boy. The order in which children are born can have an important effect on their psychological development. If most first-born children were male, the sexual stereotypes, perception of status and patterns of discrimination present in society could be reinforced.

38. There is also a risk stemming from the fact that the techniques for sex selection cannot at present be guaranteed to be accurate. If screening showed that an embryo not of the desired sex had been selected, the parents might wish to terminate the pregnancy. Should a child not of the selected sex be born, then its parents may treat it less well than if it had been of the selected sex. The welfare of that child could be affected. Similarly, if a couple had children of one sex but would have preferred one of the other, the welfare of the existing children might be affected by the arrival of the one of the preferred sex.

39. Finally, it might be argued that medical resources are limited and the facility to select the sex of a child should be reserved for those in medical need. Selection in combination with IVF treatment or artificial or donor insemination might restrict the access of infertile people to such treatment.

The HFEA would welcome views on whether sex selection for any social reasons can be considered necessary or desirable.

ETHICAL ISSUES SURROUNDING THE METHODS OF SEX SELECTION

40. Having looked at the arguments for and against the principle of sex selection and having reached the conclusion that sex selection for medical reasons is justified, it is necessary to consider also the issues surrounding the methods since some methods of sex selection may be ethically or practically more acceptable than others for the purpose of providing licensed treatment. The main arguments for and against sex selection by primary and secondary methods are presented below.

Primary sex selection (before an embryo is produced)

41. Whilst the techniques of sperm selection and timing of insemination are not completely successful, it is claimed that in the former about 80 per cent of babies conceived will be of the required sex. This potential success rate might be acceptable if the reasons for sex selection were social rather than medical. If they were medical, a one in five risk of failure, which might lead to termination of pregnancy in some cases, might well be considered too high and therefore not desirable. However, sperm selection techniques do not lead to the production of embryos which will be discarded because they might carry a sex-linked genetic defect. If, therefore, the success rate of sperm selection techniques were improved significantly so that the risk of termination of pregnancy were minimal, these techniques might be considered necessary and desirable for medical purposes.

Given that primary sex selection techniques do not result in the creation of embryos outside the body, the HFEA would welcome views on whether there are any circumstances in which they could be considered necessary or desirable.

Secondary sex selection (after an embryo is produced)

42. The use of secondary sex selection for medical reasons is already permitted in the UK. The HFEA considers pre-implantation diagnosis to be ethically acceptable where there is a risk of a life threatening disease, as explained in paragraph 17.

The HFEA would welcome views on whether secondary sex selection by pre-implantation diagnosis (as described in paragraph 11) can be considered necessary or desirable for any social reasons.

CONCLUSION

43. Some of the ethical issues discussed in this document have already been considered as part of the legislative process which led to the Human Fertilisation and Embryology Act 1990. The HFEA can only regulate those sex selection techniques which involve the creation or use of an embryo outside the body or the use of donated eggs or sperm. Thus selection of a partner's sperm followed by insemination, or timing of insemination with a partner's sperm are techniques outside the Authority's jurisdiction. However, if these techniques were used with donated sperm supplied by a sperm bank or fertility centre, then they could only be provided under a licence issued by the HFEA.

Therefore, the HFEA wishes to obtain views about the use of these techniques, whether or not they are used in circumstances which require a licence.

44. The single question "Is the selection of the sex of a child necessary or desirable for treatment?" can lead to many other questions. The HFEA welcomes views on sex selection in general and on the following particular questions:

Can primary sex selection techniques such as sperm sorting be considered necessary or desirable in any circumstances for either medical or social reasons?

Can secondary sex selection by pre-implantation diagnosis be considered necessary or desirable in any circumstances for any social reasons?

The HFEA wishes to promote public debate on these issues in order to take into account the views expressed before reaching conclusions to be incorporated into its Code of Practice. Please address your comments to:

Liz Baldock
HFEA
Paxton House
30 Artillery Lane
London E1 7LS

Fax: 071-377 1871

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